

Uniform Treatment for DFP Remnant and AdX under EDA

[go/eda-uniform-treatment](#)

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2019/04

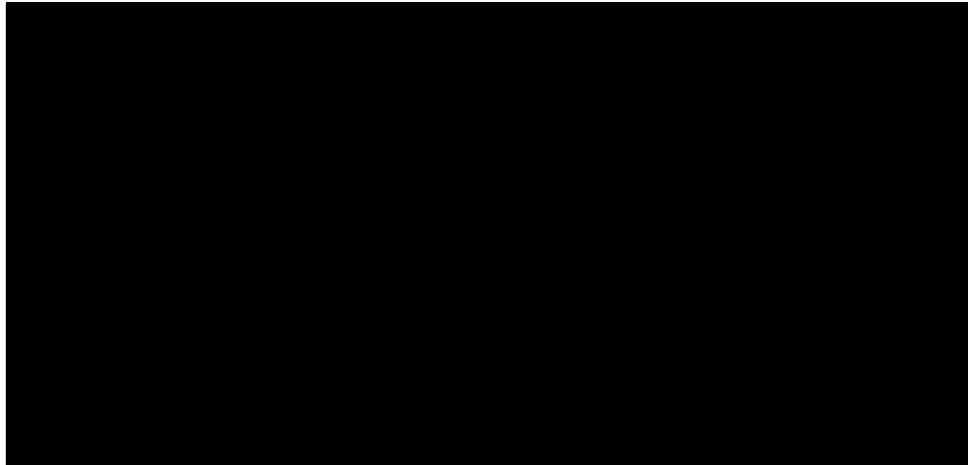
Remove probabilistic decision in choosing between DFP guaranteed (a.k.a. non-remnant) reservation ad and remnant ad when the remnant ad's eCPM is higher than the guaranteed ad's EDA price. This change will (1) improve publisher total revenue (from both direct and indirect) (2) ensure uniform treatment for DFP remnant and AdX demand under EDA so that all demand will have equal access, as we have announced with our first price auction transition.

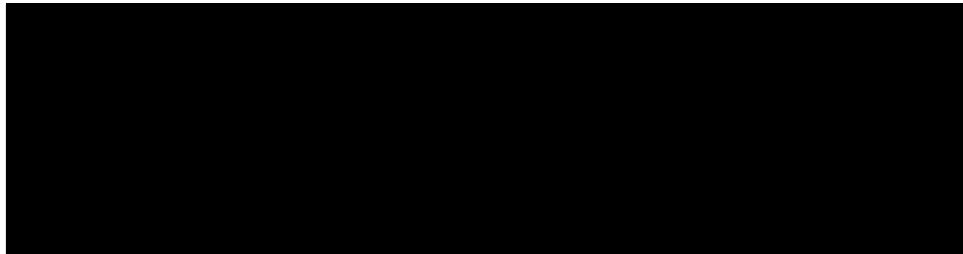
Together with the removal of AdX last look over DFP remnant, DFP remnant demand and AdX demand will have same access to DRX inventory and compete on even ground.

Side objective: establish a standardized set of evaluations for DFP reservation delivery, DFP revenue and backfill revenue which can be used for launching any DFP ranking related change with non-trivial impact to DFP ad selection and/or backfill competition.

Commented [1]: This is a very worthy objective!

Enhanced Dynamic Allocation introduces competition between guaranteed reservations and other demand including AdX and DFP remnant reservations, by allowing AdX or DFP remnant to win over high priority DFP guaranteed reservations if it has a higher price than the *opportunity cost* (also called EDA price) set by us. The EDA price is calculated in such a way that the DFP guaranteed reservation's delivery goal would not be compromised.





The AdX and DFP remnant demand are not treated symmetrically in that: the AdX demand can win over DFP guaranteed reservation ad as long as its bid is higher than the EDA price whereas DFP remnant ad with high eCPM can only win over the guaranteed ad probabilistically.

The reason for such asymmetric treatment is that when EDA was designed [1, 2] back in 2011 and launched in 2014, header bidding was non-existent and DFP remnant line items were of similar granularity of targeting as guaranteed reservation ads and mostly were either direct-sold non-guaranteed ads with fixed CPM or tags for specific third party networks with the CPM being the average CPM across impressions. Therefore, for a guaranteed reservation ad, the matched competing remnant ad would often be of the same static CPM, and it made sense to simply do a coin-flip decision to make sure that the guaranteed ad can only be replaced at certain probability.

While such logic made sense in the context of static DFP remnant line item prices, with the creation and increased adoption of header bidding, more and more DFP remnant line items are more like AdX programmatic competition with dynamic CPM for each specific query and should be treated in the same way.

Example scenario showcasing the different treatments:

- *One DFP Standard ad, slightly behind schedule, with desired passing probability being 10%.*
- *The AdX bid distribution for this inventory has \$10 being 90-th percentile, and \$50 being 99-th percentile.*
- *The EDA price of this Standard ad would be \$10.*

In this case, if there is an AdX bid at \$50 (assuming no other competition), then it will always serve because it is higher than the EDA price of \$10. However, if there is a matched DFP remnant ad at \$50 CPM (assuming no other competition), then it can only serve at probability of $(0.99-0.9)/0.99 \approx 9\%$.

Another example is that one of our premium publishers, New York Times, had questioned about their super high-value remnant line items (header bidding) often getting rejected even when its CPM is a lot higher than the EDA price, and balusivan@ had to make a special case change for them to ensure their high-value remnant ads can serve as desired.

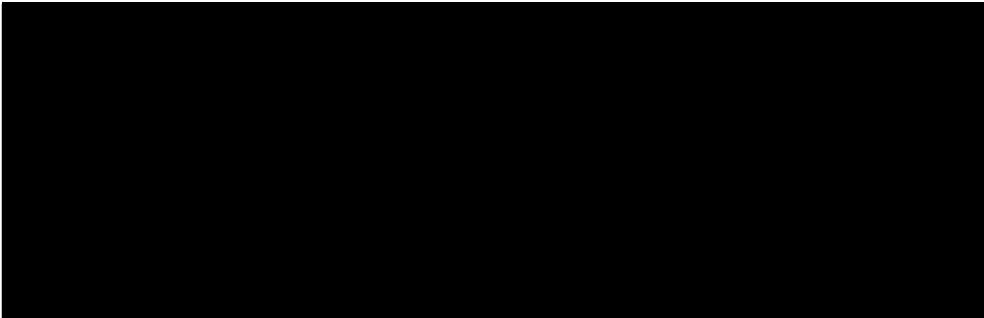
In order to apply uniform treatment to remnant and AdX demand and meanwhile making sure that guaranteed reservation ads' delivery goals are not compromised, we need to make two changes

- (1) Remove the probabilistic replacement logic when DFP remnant is competing against non-remnant reservation ad. Remnant line item should be able to win over non-remnant line item as long as its eCPM is higher than the EDA price for the non-remnant line item.
- (2) The bid distribution collected for setting the EDA price should include not only the AdX bids, but also the prices of the matched remnant ads.

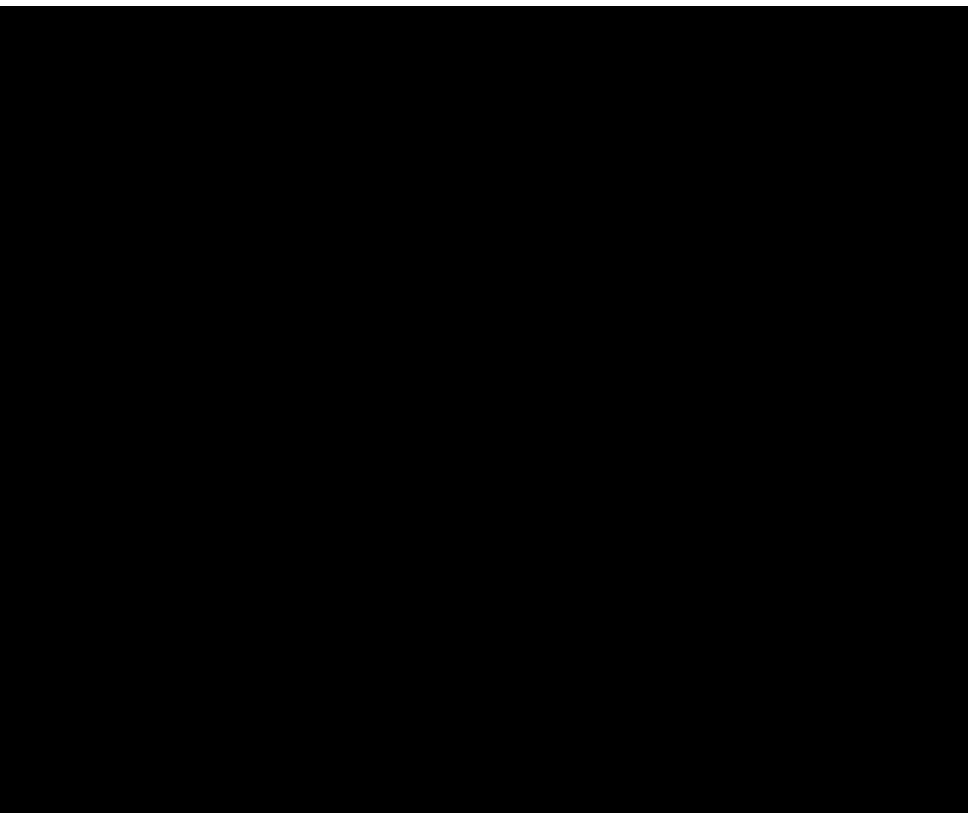
- Fair access for DFP remnant (including header bidding) and AdX demand.
 - Aligns with our narrative of "every offer from programmatic buyers will compete in the same unified auction, alongside inventory which is directly negotiated with advertisers" as mentioned in our first price transition announcement.
 - More trust from publishers.
- Optimize and increase publishers' overall revenue. More revenue for publishers from DFP remnant line items.
 - There may be revenue shift from AdX to DFP remnant - to be discussed in more details in the Risk section below.
- EDA logic as explained in the above section will be greatly simplified - making EDA easier to understand, and a lot of the complexities in DFP ranking code regarding maximum-remnant-serving-probability can be removed. #simplicityisbeauty
 - This simplification will also make other the design and implementation of other work like removing last look over remnant and supporting multi-winners in EDA easier.

The main risk of this change is that the AdX revenue may decrease and shift to DFP remnant. The extent of such revenue shift is hard to estimate given the pacing implications, various bid patterns from remnant and AdX for each inventory slices, etc. Running live experiment with split-pacing is the best way to estimate.

In case that the result from live experiment shows too big of an AdX revenue drop, here are some compromising alternatives:



To avoid reputation / trust risk of different treatment for different demand, if the original proposal is not viable, at least one of the alternatives should be implemented.





Given the magnitude of change to the bid distributions, and the impact to the ad selection logic and pacing, this change needs to be evaluated in the control/optimized group setting with split pacing.

